SPHINCTER INVOLVEMENT IN LUMBAR DISC HERNIATION

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ABSTRACT

A retrospective analysis of 30 operated cases of prolapsed lumbar disc with cauda equina syndrome was carried out. 27 were male and 3 were female. Age varied from 27 to 60 years. 10 were acute presentation and 20 had previous history of backache-sciatica syndrome. The most common sphincter dysfunction was urinary retention and other neurological findings, pointing to sphincter involvement were impairment of sensation in the perineum, lax anal sphincter and absent superficial anal reflex. The other motor or sensory deficit depended on level of disc herniation. The majority of our patients reached us between 7-14 days after onset of sphincter dysfunction. Emergency myelogram was the most common investigation done and L 4/5 was most common disc herniation. Emergency surgery was done in 24 cases and semi emergency in 6 cases. Patients were followed up and at 1 year follow-up 12 had recovered fully, 7 partially and in rest 11 patients there was no significant improvement in sphincter functions.

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KEY WORDS: Lumbar disc herniation; Sphincter dysfunction.

Introduction

Since 1934 when Mixter and Barr [1] recognised the neurological complications of prolapse lumbar disc, it has been known that compression of cauda equina could result in paralysis of bladder and bowel sphincters. However, only 5 reports on sphincter involvement due to lumbar disc herniation have been published and prognosis have been generally gloomy [2-6]. However, Shapiro [7] reported much better results if surgery could be done within first 48 hours.

In our setting due to long distances, ignorance of implications of sphincter involvement, complacency and at times casualness, these patients generally present late to the centres where urgent investigations and surgery can be done and by then the result of surgery even if done as an emergency are not so gratifying as they would be if surgery could be done within hours of onset of sphincter dysfunctions.

Material and Methods

A review of records of 30 cases of lumbar disc herniations with cauda equina syndrome, operated at Neurosurgery centre Command Hospital (SC) Pune, between Jan 95 to Jan 98 was carried out. The information regarding clinical, radiological, operative findings and final outcome was abstracted. The diagnosis was based on clinical findings, imaging study of lumbar spine and confirmed at operation. Patients were evaluated at 3, 6 and 12 months after surgery by symptomatology, neurological examination, renal biochemistry, ultrasound study for kidney, ureter and bladder including for post void residual. Urodynamic study could

be done in 5 patients and post surgery myelogram in 4 cases.

Complete recovery was defined as normal bladder, bowel and sexual functions and no post void residual urine on ultrasonography. Partial recovery was defined as nearly normal bowel control, fair urinary control, may strain a bit to pass urine, some sexual function and post void residual urine less than 50 ml. Poor recovery was defined as requirement of laxatives for bowel movement, poor urinary control and requirement of manual compression of abdomen for passing urine (Crede's manoeuvre), no sexual function and post void residual urine of more than 50 ml.

Results

Between Jan 1995 to Jan 1998, 380 patients underwent surgery for lumbar disc herniations. 30 of these cases (7%) were having cauda equina syndrome with sphincter involvement of bladder and bowel. 27 were male and 3 were female patients. Age ranged from 25 years to 60 years and 18 patients were in 4th decade.

Some of our patients travelled long distances. Starting from Punjab in North, Bihar in East and Tamil Nadu and Kerala down South, Rajasthan in West. However, 19 of our patients came from Maharashtra (Fig-1). 20 patients had previous history of low backache sciatica syndrome and presented with aggravation of pain along with sphincter dysfunction. 10 patients had first time acute presentation with sphincter involvement. None of these patients had undergone lumbar spine surgery previously. At the time of presentation 25 had bilateral sciatica, one side worse than the other. Only 5 patients had unilateral sciatica. (The sciatica pain however, decreased in intensity in 14 patients over the course of illness). There was spectrum of symptoms related to the sphincter involvement.

20 had urinary retention and were catheterised at the referring hospital, 6 had urgency, 4 had hesitancy and 3 also had stress incontinence. Bowels were incontinent in 8, constipated in 18, normal in 4 patients. All male patients had failure of penile erections though exact sexual history was not possible in this painful

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Fig. 1 : Showing statewise distribution of patients

condition. The duration of sphincter involvement varied from 2 to 3 months.

All patients had clinical features of lumbar disc prolapse i.e. paraspinal spasm and reduced straight leg raising. The motor weakness in lower limbs was bilateral, with one side more than the other. Weakness of knee extensors was in 8, extensor hallucis longus and ankle dorsiflexors in 15 and plantar flexor in 10. One patient had total paraplegia.

All patients had some perineal sensory impairment which was partial in 8 and complete in 22. The sensory impairment in lower limbs was variable, being in L4 dermatome and below in 8, L5 and below in 15 and S1 in 6 cases. In one case it was below L1 bilaterally. Bilateral ankle jerks were absent in 22, knee jerk in 3 and unilateral ankle jerk in 3 and knee jerk in 2 patients. Clinically significant reflex pertaining to sphincter dysfunction was superficial anal reflex, which was lost in 20 patients and diminished in 6. Bulbocavernosus reflex could not be elicited reliably in 12 patients and was absent in 8 patients.

22 patients reported to the doctor within 24 hours of onset of symptoms of sphincter dysfunction, 4 within 48 hours, 2 within 2 days, and 2 after a month. On an average, they had two or more consultations before reaching our centre. The time lapse between sphincter dysfunction and reporting to our centre was variable. 2 patients reported within 48 hours, 2 before 7 days, 17 between 8 and 14 days, 6 between 15 and 30 days, and 3 beyond 1 month and one reaching after 3 months of sphincter involvement.

Plain radiography of lumbar spine showed a reduction of disc space in 8 patients (27%), implying thereby a large disc herniation. 27 of our patients underwent myelography, which revealed partial extradural block in 6 cases (Fig-2), intradural block in 1 (Fig-3). And total block in 20 cases (Fig-4). Lumbar canal stenosis was seen in 5 cases. Computed tomographic myelography (CT Myelo) was concomitantly done in 12 patients (Fig-5) and showed non-visualisation of contrast at the level of herniation. It really did not add to the information provided by the lumbar myelography. Magnetic resonance imaging (MRI) was done in 3 cases and provided more precise information on disc prolapse (Fig-6). The most common level of herniation was L4/5 in 15, followed by L3/L4 in 8, L5/S1 in 6 and L1/2 in 1 case (Table-1).

Fig. 2 : Lumbar myelogram showing partial block of contrast column at L4/5 level

TABLE 1

Incidence of disc herniation at various levels with sphincter involvement

Level of disc herniation	No. of cases
L 1 - 2	1
L 2 - 3	0
L 3 - 4	8
L 4 - 5	15
L 5 - S1	6

Emergency surgery was performed in 24 cases and semi-emergency or early elective surgery in 6 cases, which means surgery on next operating day and these were patients with minimal sphincter dysfunction or very late cases. All patients underwent laminectomy and discectomy. Large extruded fragment was found in 23 cases and small herniation in 7 cases. The disc herniation was found posterolateral in 17 cases, centromedian in 13 cases. The extruded fragment was removed and disc space cleared of loose intradiscal fragments in all cases. Disc removal was extradural-lateral in 27 cases and transdural in 3 cases. Post operative period was complicated by wound sepsis in 1 patient and urinary tract infection in 3. After initial period of bladder catheterisation, patients were put on intermittent self-catheterisation. Pain relief following surgery was found in all cases but early neurological re-

Fig. 3: Lumbar myelogram showing intradural block at L 3-4 level

Fig. 4: Myelogram showing complete block of contrast column at L 4-5 level

covery of sphincter function was seen in 6 patients only.

All patients were followed at 3 months, 24 patients at 6 months and 18 at 1 year. Ultrasound study did not show any back pressure effects on upper tracts but variable amount of postvoid residual urine was found in patients with impaired sphincter functions. Renal biochemistry remained normal in all cases. Urodynamic study could be done in 5 cases after 6 months. 2 showed areflexic detrusor, 3 hyporeflexic detrusor, all had loss of bladder filling sen-

Fig. 5: CT myelogram showing obliteration of contrast column at L 4-5 due to large disc herniation

Fig. 6: MRI showing a large disc herniation at L4-5

sation, low urethral pressure was found in 3 and high in 2 patients with high urethral pressure had more than 50 ml residual urine and those with low, less than 50 ml.

6 patients recovered fully by 3 months. 4 were of partial sphincter involvement and 2 with complete. 7 showed partial recovery and 17 did not show any significant recovery. At 6th

month, 6 more patients recovered fully and 4 were in partial recovery group, 14 patients remained unchanged. By one year, 3 more patients recovered partially, however, 11 patient remained in poor recovery group. Thus by the end of one year only 12 patients had recovered fully, 7 partially and 11 had no recovery, the motor and sensory deficit in lower limbs also did not improve in 6 of them. 4 of these patients underwent repeat myelography which showed a block. But surgical exploration revealed no disc herniation, durotomy done revealed arachnoiditis which was proved on histopathological examination.

Discussion

Cauda equina syndrome resulting in sphincter dysfunction is relatively uncommon though most dreaded complication of lumbar disc herniation. Patients with this complication constitute only 1-3% of operated lumbar disc prolapse cases [3,4,7-10]. The clinical features of cauda equina syndrome include disturbed bladder functions which may be increased frequency, hesitancy, urgency, precipitancy, stress incontinence or urinary retention, bowel dysfunction in the form of faecal incontinence or constipation, sexual function impairment and asymmetric motor weakness and sensory deficit in lower limbs with perineal sensory impairment which is usually bilateral but can be unilateral. The male predominance and common occurrence in 4th decade of life does not differ from common lumbar disc prolapse and is well documented [7]. One-third of our patients had first time acute presentation and it is therefore important that this aspect is not overlooked at first examination.

Though majority of patients will have bilateral sciatica, patient with unilateral sciatica can also have bladder dysfunction and even some patients may not have sciatica at all [11]. The sciatica pain may decrease over a period of time due to progressive compression resulting in complacency on the part of patient or unsuspecting doctor or both. The clinical features of motor weakness and sensory impairment in lower limbs will depend on the level of their prolapse and degree of compression, but significant pointer to sphincter involvement is a lax anal sphincter, perineal sensory loss or impairment and absence of superficial anal reflex and bulbocavernosus reflex. We found it easier to test superficial anal reflex than bulbocavernosus reflex.

In our series, though majority of patients reported to nearest medical centre within 48 hours but only two reached at our hospital within this time frame and rest much later after having taken 2 or more consultations. Thus showing that there is lack of desired urgency either due to ignorance or complacency on the part of medical staff, patient or both.

Radiography of lumbar spine is done to exclude any

bony pathology, however, reduction of disc space which is uncommonly seen in uncomplicated disc herniation was seen in 27% cases with sphincter involvement, implying indirectly a large disc herniation. Lumbar myelography should be done urgently and is usually adequate in this situation. Concomitant CT myelography has really not added to the information or in surgical planning. MRI is non-invasive investigation and investigation of choice for imaging disc herniation and thus desirable.

Out of many options available for removal of herniated lumbar disc i.e. standard discectomy, fenestration, microdiscectomy or percutaneous lumbar discectomy, the operative procedure required for patient with cauda equina syndrome is standard discectomy as it affords gentle retraction of already compromised neural tissue, immediate decompression and thorough discectomy, the desired ultimate goal in this situation [9,12]. Excessive manipulation during lumbar disc surgery can cause permanent paralysis [7,13]. Generally disc can be removed extradurally but we had to open dura in 3 cases of transdural herniation.

In view of poor recovery of sphincter function in case of lumbar disc prolapse with cauda equina syndrome, early emergency surgery has been recommended [2-7]. It has also been emphasized that quality of recovery bore direct relation to the length of symptoms before surgery [3,4,9]. However, Jannett [2] and O'Laire [11] did not find any correlation between the time of surgical decompression and recovery of sphincter functions, although no objective assessment of these functions was made. Neilsen et al [9] and Hellstrom et al [14] showed that surgery done within 48 hours of onset of symptoms of sphincter involvement did very well in respect of bladder and sexual functions.

Shapiro in 1983 [7] convincingly proved that patient operated within 48 hours recovered 100% in respect to bladder functions as compared to 33% in cases operated beyond this time. Our series shows that recovery of sphincter functions in patients with complete involvement is unpredictable and in large number of these it is poor. The referral of these patients to appropriate centre where urgent investigation and surgery can be done, is unreasonably delayed, putting them beyond the desired therapeutic time window. Since it has now been proved that surgery done within 48 hours or even earlier, definitely gives better and predictable result, it is, desirable that these patients are evacuated by fastest means (even by air to nearest appropriate centre so as to avoid life long suffering and despair due to poor bladder, bowel and sexual

functions and thus poor quality of social and personal life in these otherwise young and healthy individuals. The investigation of choice for evaluation of neurogenic bladder is urodynamic study which could be done in only 5 cases due to closure of facility at Pune city. Since urodynamic study is not available at all places, many of these patients can be evaluated by ultrasonography for residual urine and upper urinary system and will satisfactorily help in guiding the management as most of them are effectively managed with self intermittent catheterisation or by Credes' manoeuvre. Arachnoiditis is disabling late complication of lumbar disc herniation and little can be done for it. But, if surgery is performed early then chances of its development will be far less.

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